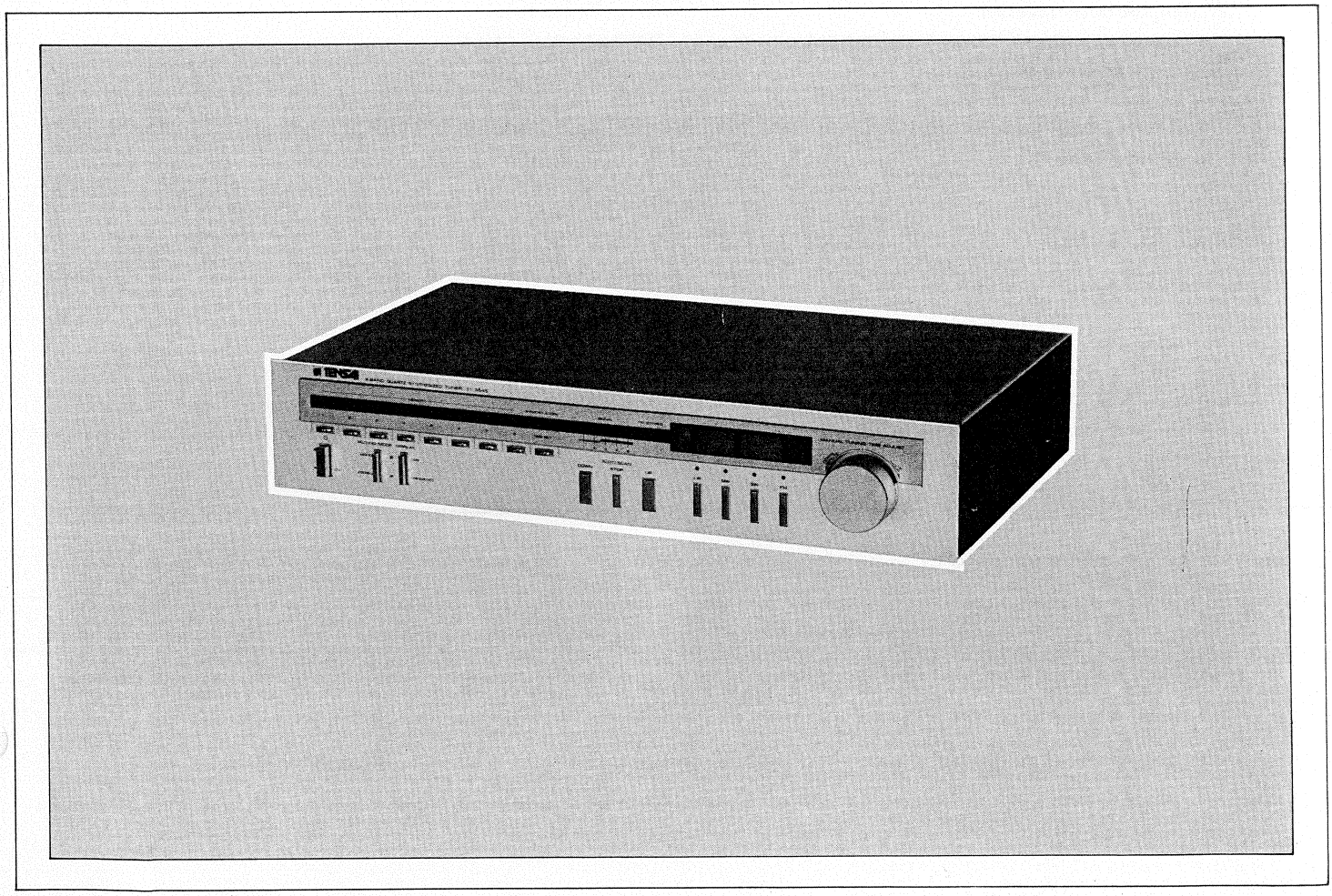
Service Manual

Quartz Synthesized Tuner
MODEL T T3545

TENSAI
INTERNATIONAL



1. SPECIFICATIONS

FM PERFORMANCE

Frequency Range . . . . . 87.5 – 108.1 MHz
IHF Sensitivity at 98 MHz . . . . . 1.5 μV
S/N at 1000 μV, at 98 MHz (mono) . . . . . 65 dB
(stereo) . . . . . 60 dB
Fidelity ±1 dB,
1000 μV at 98 MHz . . . . . 20 – 15000 Hz
Output Level at 1000 μV
at 98 MHz 75 kHz dev. 1V
Selectivity at 100 μV ±400 kHz . . . . . 50 dB
Muting Level . . . . . 25 μV
Auto Scanning Sensitivity at 98 MHz . . . . . 25 μV
Separation at 1000 μV 98 MHz, 1000 Hz . . . 45 dB
Stereo THD at 1000 μV 98 MHz, 1000 Hz . . . 0.3%

AM PERFORMANCE

Frequency Range
LW . . . . . 146 – 353 kHz
MW . . . . . 513 – 1620 kHz
SW . . . . . 5.950 – 9.775 MHz
Sensitivity for 20 dB S/N
LW . . . . . 100 μV
MW . . . . . 50 μV
SW . . . . . 50 μV
Auto Scaning Sensitivity . . . . . 200 μV
S/N at 1 mV (MW) . . . . . 45 dB
Output Level at 1 mV 1000 kHz
80% mod. (MW) 1V

GENERAL

Power Source . . . . . ∿220 – 240 V 50 Hz
Dimensions . . . . . 430(W) x 80(H) x 250(D) mm
Weight . . . . . 4.5 kg (Approx.)
Accessories . . . . . FM wire antenna
AM wire antenna
US pin plug cord

Subject to changes without notice.

2. DISASSEMBLY INSTRUCTIONS

(1) **Top cover removal**
Remove four screws on the both sides of the set and lift up the top cover.

(2) **Bottom cover removal**
Remove a screw on the center of the bottom cover and lift the bottom cover.

(3) **Front panel removal**
Remove six rotary knobs.
Remove four screws (A) from top and bottom as shown in Figure 1 and 2, and the front panel with push buttons can be removed.

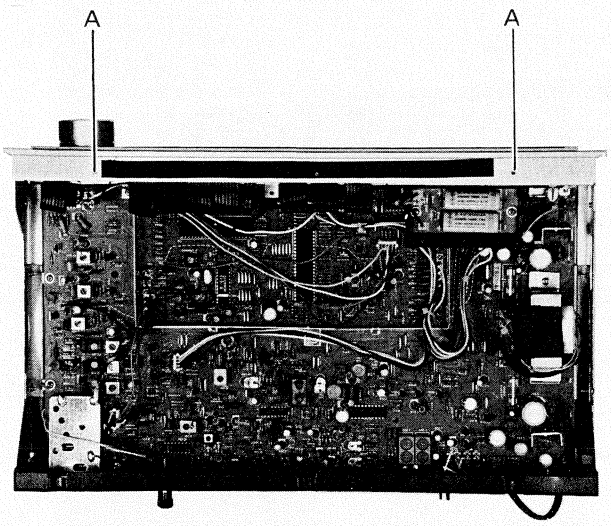


Figure 1

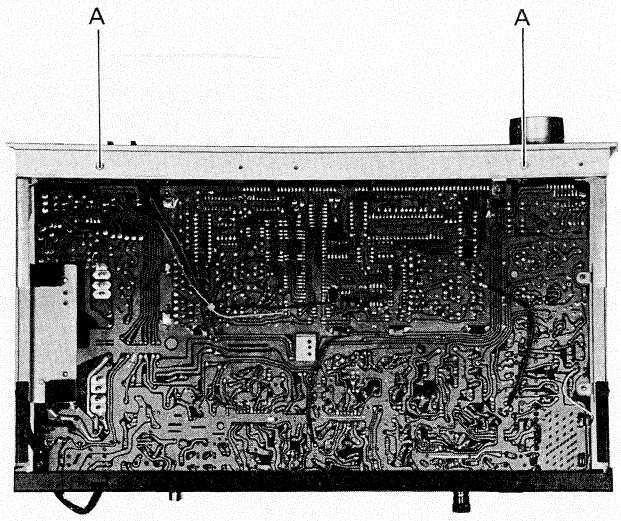


Figure 2

3. ALIGNMENT INSTRUCTIONS

Test equipments for AM

(1) Sweep signal generator (Sweep range of at least 7 kHz, center frequency of 468 kHz).
(2) Signal generator with frequency range of at least from 140 kHz to 10 MHz.
(3) Oscilloscope with wide range amplifier of approx. 100 kHz.
(4) IEC dummy antenna. (Figure 3)
(5) DC and AC Volt meter with high impedance. (DCVM, ACVM)
(6) Frequency counter with frequency range at least 12 MHz.
(7) RF amplifier with 40 dB gain in 12 MHz.

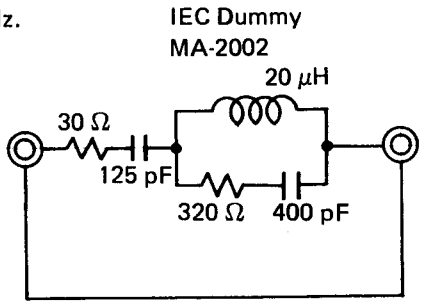


Figure 3

Test equipments for FM

(1) Signal generator with frequency range of at least from 87 MHz to 109 MHz.
(2) FM stereo modulator.
(3) Frequency counter with frequency range of at least 77 kHz.
(4) Center meter.
(5) 75 ohm matching pad.
(6) DCVM and ACVM.

Test equipments for X'tal alignment

(1) RF amplifier with gain of at least 40 dB in 12 MHz.
(2) Frequency counter with frequency range at least 12 MHz.
(3) Pick-up coil with tuning frequency of 11.52 MHz. (Figure 4)

NOTE:

(1) During alignment keep the putout level of signal generator to lowest where usable output can be maintained from the set.
(2) Modulation of signal generator. . . . . .400 Hz 30% for AM.
otherwise noted. 1 kHz 75 kHz deviation.

X'tal Frequency Alignment (If necessary)

(1) For alignment point, see Figure 13.
(2) Proceed as outlined in the TABLE 1 X'TAL ALIGNMENT CHART.

TABLE 1 X'TAL ALIGNMENT CHART. (See Figure 4)

Step	Output Indicator Connection	Adjusting Point	Adjustment
1	Frequency Counter as shown in Figure 4	C615	11,520,000 ± 20 Hz

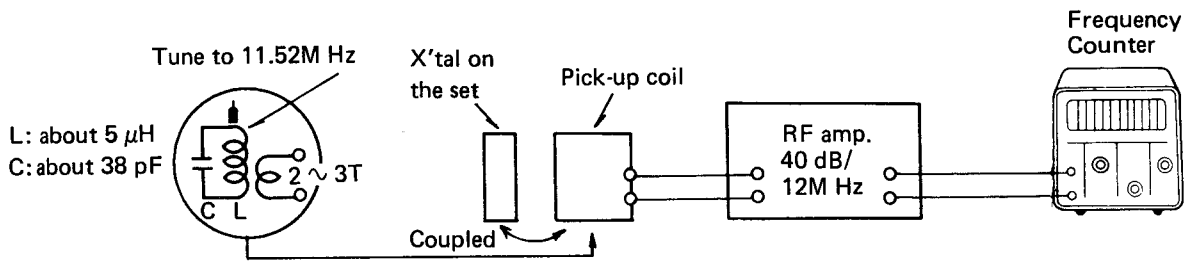


Figure 4

AM ALIGNMENTS

IF Alignment

(1) Set Function to MW.
(2) For alignment point, see Figure 8.
(3) Proceed as outlined in the TABLE 2 IF ALIGNMENT CHART.

TABLE 2 IF ALIGNMENT CHART (See Figure 5)

Step	Signal Generator Connection	Signal Generator Frequency	Radio Dial Setting	Oscilloscope Connection for Adjustment	Adjusting Point	Adjustment
1	Sweep Generator through buffer to AM ANT.	———	513 kHz	Scope to TP4 as shown in Figure 5.	IT202, 203	Align "IF curve" in Figure 5.

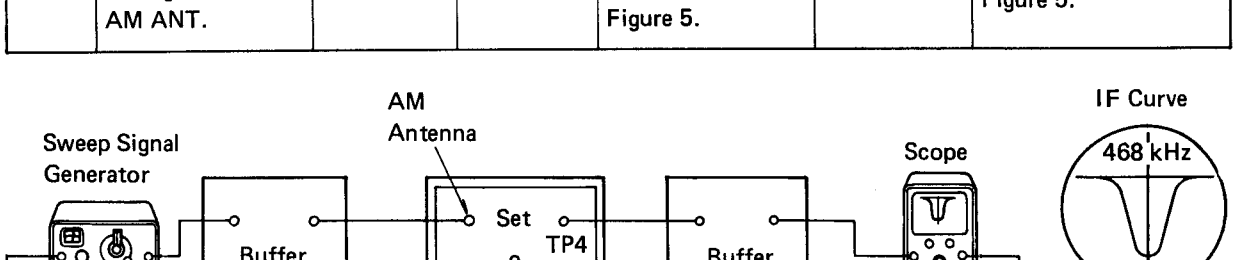


Figure 5

LW Alignment

(1) Set Function to LW.
(2) For alignment point, see Figure 8.
(3) Proceed as outlined in the TABLE 3 LW ALIGNMENT CHART.

TABLE 3 LW ALIGNMENT CHART (See Figure 6)

Step	Signal Generator Connection	Signal Generator Frequency	Radio Dial Setting	Meter Connection for Adjustment	Adjusting Point	Adjustment
1	IEC Dummy Antenna	———	146 kHz	DC VM to TP7	L112	1.5V ± 0.4V
2	Same as step 1	———	353 kHz	Same as step 1	L112	9V ± 0.5V
3	Repeat steps 1 and 2 unti no further improvement is noticed.					
4	Same as step 1	173 kHz	Tune to signal (173 kHz)	ACVM across OUTPUT terminal	L109	Adjust for maximum.
5	Same as step 1	317 kHz	Tune to signal (317 kHz)	Same as step 4	TC115	Same as step 4
6	Repeat steps 4 and 5 until no further improvement is noticed.					

MW Alignment

(1) Set Function to MW.
(2) For alignment point, see Figure 8.
(3) Proceed as outlined in the TABLE 4 MW ALIGNMENT CHART.

TABLE 4 MW ALIGNMENT CHART (See Figure 6)

Step	Signal Generator Connection	Signal Generator Frequency	Radio Dial Setting	Meter Connection For Adjustment	Adjusting Point	Adjustment
1	IEC Dummy Antenna	————	513 kHz	DCVM to TP7	L111	1.5V ± 0.4V
2	Same as step 1	————	1620 kHz	Same as step 1	L111	10V ± 0.5V
3	Repeat steps 1 and 2 until no further improvement is noticed.					
4	Same as step 1	594 kHz	Tune to signal (594 kHz)	ACVM across OUTPUT terminal	L108	Adjust for maximum.
5	Same as step 1	1413 kHz	Tune to signal (1413 kHz)	Same as step 4	TC110	Same as step 4
6	Repeat steps 4 and 5 until no further improvement is noticed.					

SW Alignment

(1) Set Select Button to SW.
(2) For alignment point, see Figure 8.
(3) Proceed as outlined in the TABLE 5 SW ALIGNMENT CHART.

TABLE 5 SW ALIGNMENT CHART (See Figure 6)

Step	Signal Generator Connection	Signal Generator Frequency	Radio Dial Setting	Meter Connection for Adjustment	Adjusting Point	Adjustment
1	IEC Dummy Antenna	————	5.95 MHz	DCVM to TP7	L110	1.5V ± 0.4V
2	Same as step 1	————	9.775 MHz	Same as step 1	L110	10V ± 0.5V
3	Repeat steps 1 and 2 until no further improvement is noticed.					
4	Same as step 1	6.5 MHz	Tune to signal (6.5 MHz)	ACVM across OUTPUT terminal	L107	Adjust for maximum.
5	Same as step 1	8.5 MHz	Tune to signal (8.5 MHz)	Same as step 4	TC108	Same as step 4
6	Repeat steps 4 and 5 until no further improvement is noticed.					

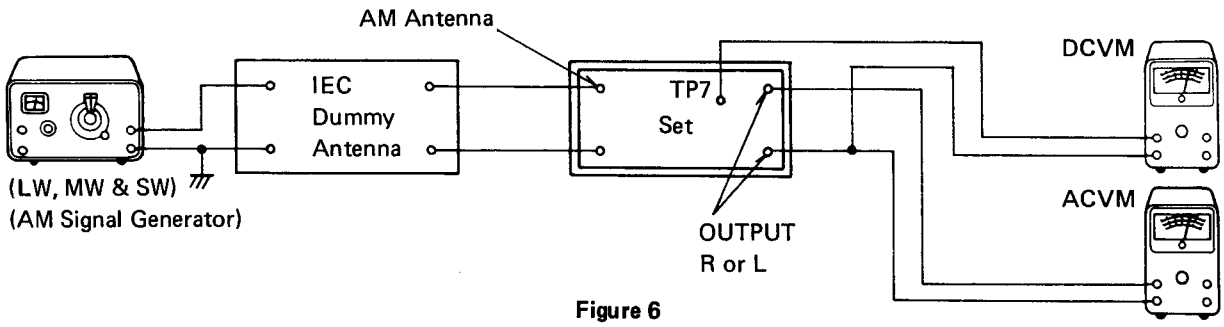


Figure 6

AM Auto Stop Alignment

(1) Set Select Button to MW.
(2) For alignment point, see Figure 8.
(3) Proceed as outlined in the TABLE 6 AM AUTO STOP ALIGNMENT CHART.

TABLE 6 AM AUTO STOP ALIGNMENT CHART (See Figure 7)

Step	Signal Generator Connection	Signal Generator Frequency & Output	Radio Dial Setting	Meter or Connection for Adjustment	Adjusting Point	Remarks
1	Dummy Antenna	999 kHz	Tune to signal counterclockwise (999 kHz)	DC Voltmeter TP1 ∿ GND	IT204	8V ± 0.5V

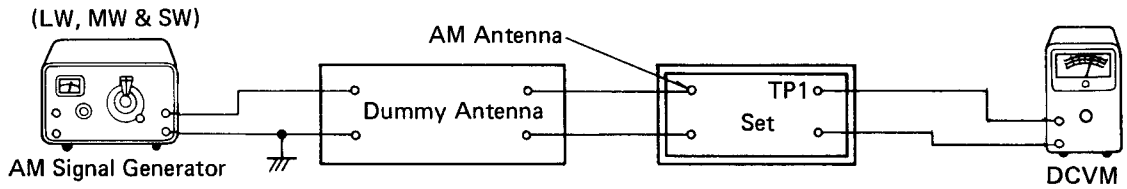


Figure 7

ALIGNMENT POINTS

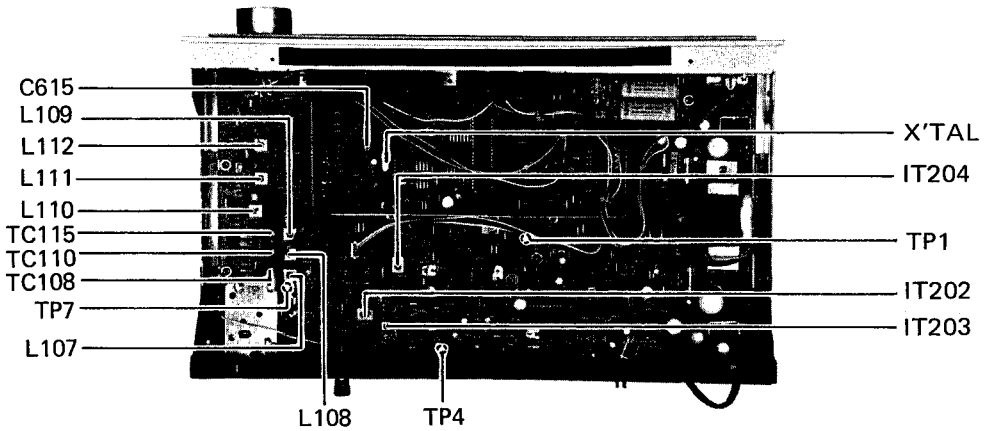


Figure 8

FM ALIGNMENTS

(1) Set Function to FM.
(2) Set the MUTING switch to OFF (■).
(3) For alignment point, see Figure 13.
(4) Proceed as outlined in the TABLE 7 FM ALIGNMENT CHART.

TABLE 7 FM ALIGNMENT CHART (See Figure 9)

Step	Signal Generator Connection	Signal Generator Frequency	Radio Dial Setting	Meter or Connection for Adjustment	Adjusting Point	Remarks
1	———	———	———	Center meter across TP5 and TP6	IT201 (Pink)	Adjust to center
2	75 ohm matching pad	98 MHz (1mV)	Tuning to signal	Distortion meter to OUTPUT	IT201 (Blue)	Minimum distortion
3	Repeat steps 1 and 2 until no further improvement is noticed.					
4	Same as step 2	98 MHz (40μV)	Tune to signal	———	SVR209	Adjust to mute off
5	———	———	* 87.5 MHz	DCVM to TP7	Lo on Block FM	2.8 ∿ 2.9V
6	———	———	108.1 MHz	Same as step 1	TCo on Block FM	9.0 ∿ 9.1V
7	75 ohm matching pad	90 MHz	Tune to signal	ACVM across output terminal	La, Lr on Block FM	Adjust for maximum
8	Same as step 7	106 MHz	Tune to signal	Same as step 7	TCa, TCr on Block FM	Same as step 7
9	Repeat steps 7 and 8 until no further improvement is noticed.					

CAUTION

* The lowest frequency range must not be bellow 87.5 MHz in order to comply with FTZ regulations in West Germany.

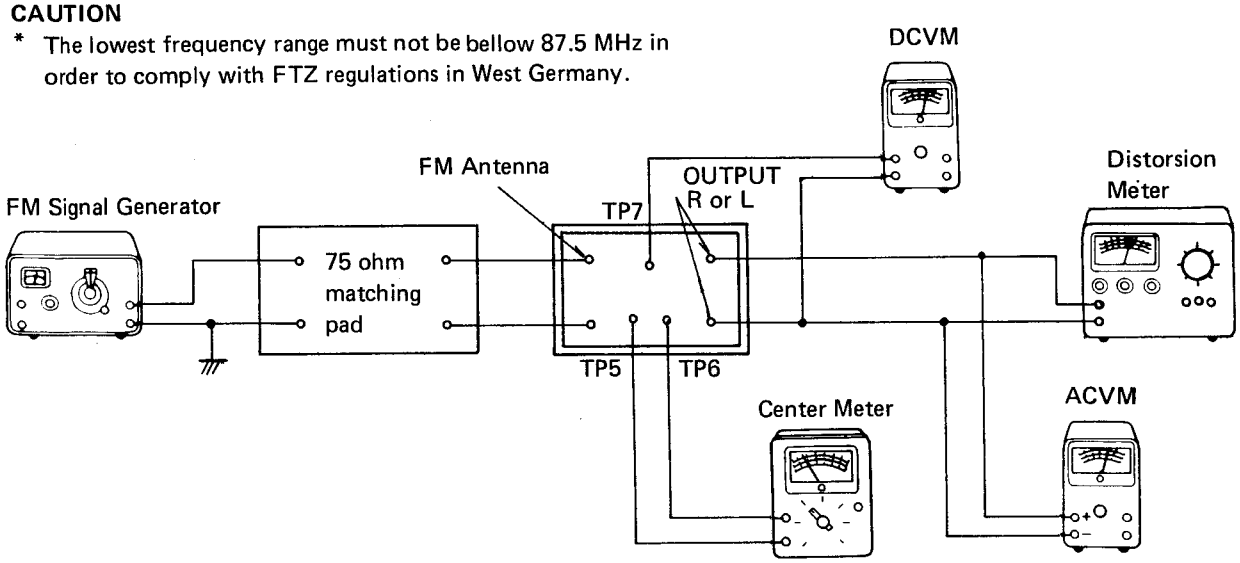


Figure 9

FM Stereo Alignment

NOTE:

(1) Set the deviation meter by the signal of L – R and switch mode desired.

Alignment

(1) Connect the equipments as shown in Figure 10 or Figure 11.
(2) Set the MUTING switch to ON (▬).
(3) RF signal input should be about 60 dB (1mV).
(4) Set the turning to a quiet point.
(5) Proceed as outlined in the TABLE 8 FM STEREO ALIGNMENT CHART.
(6) For alignment point see Figure 13.

TABLE 8 FM STEREO ALIGNMENT CHART (See Figures 10 & 11)

Step	Modulation Frequency	Modulation Mode Setting	Modulation Level Setting	Connection	Adjusting Points	Adjusting Level etc.
1	——	——	0%	Figure 10	SVR263 slightly	76.0 ±0.076 kHz
2	1000 Hz	Stereo Rch with pilot	90% (Main & Sub) (67.5 kHz dev.) 10% (Pilot) (7.5 KHz dev.)	Figure 11	SVR279, 280 (slightly separation)	Adjust for minimum.

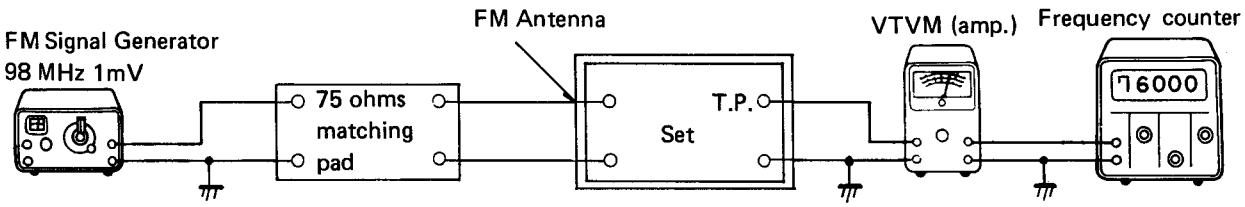


Figure 10

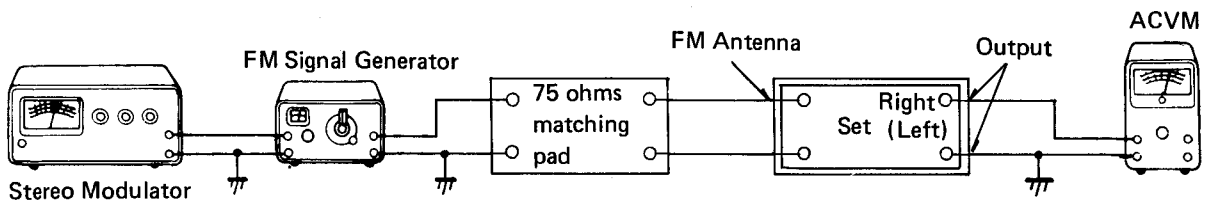


Figure 11

FM Auto Stop Alignment

(1) Set Function to FM.
(2) For alignment point, see Figure 13.
(3) Proceed as outlined in the TABLE 9 FM AUTO STOP ALIGNMENT CHART.

TABLE 9 FM AUTO STOP ALIGNMENT CHART (See Figure 12)

Step	Signal Generator Connection	Signal Generator Frequency & Output	Radio Dial Setting	Meter Connection for Adjustment	Adjusting Point	Adjustment
1	300 ohms matching pad	98 MHz 40 μV	Tune to signal (98 MHz)	DC Volt Meter TP1 ∿ GND	SVR209	8V ±0.5V

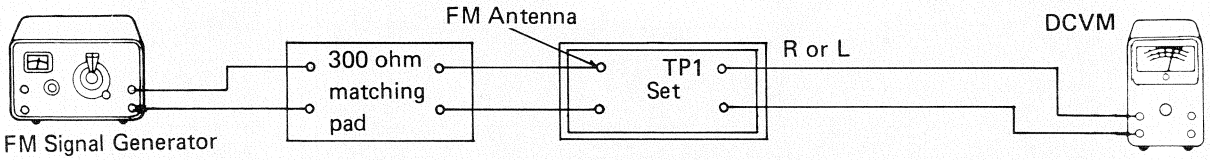


Figure 12

ALIGNMENT POINTS

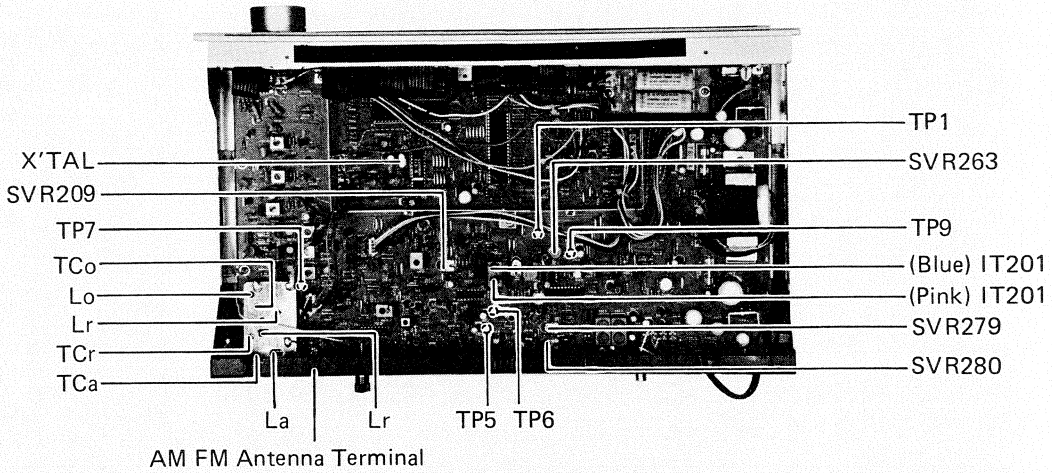
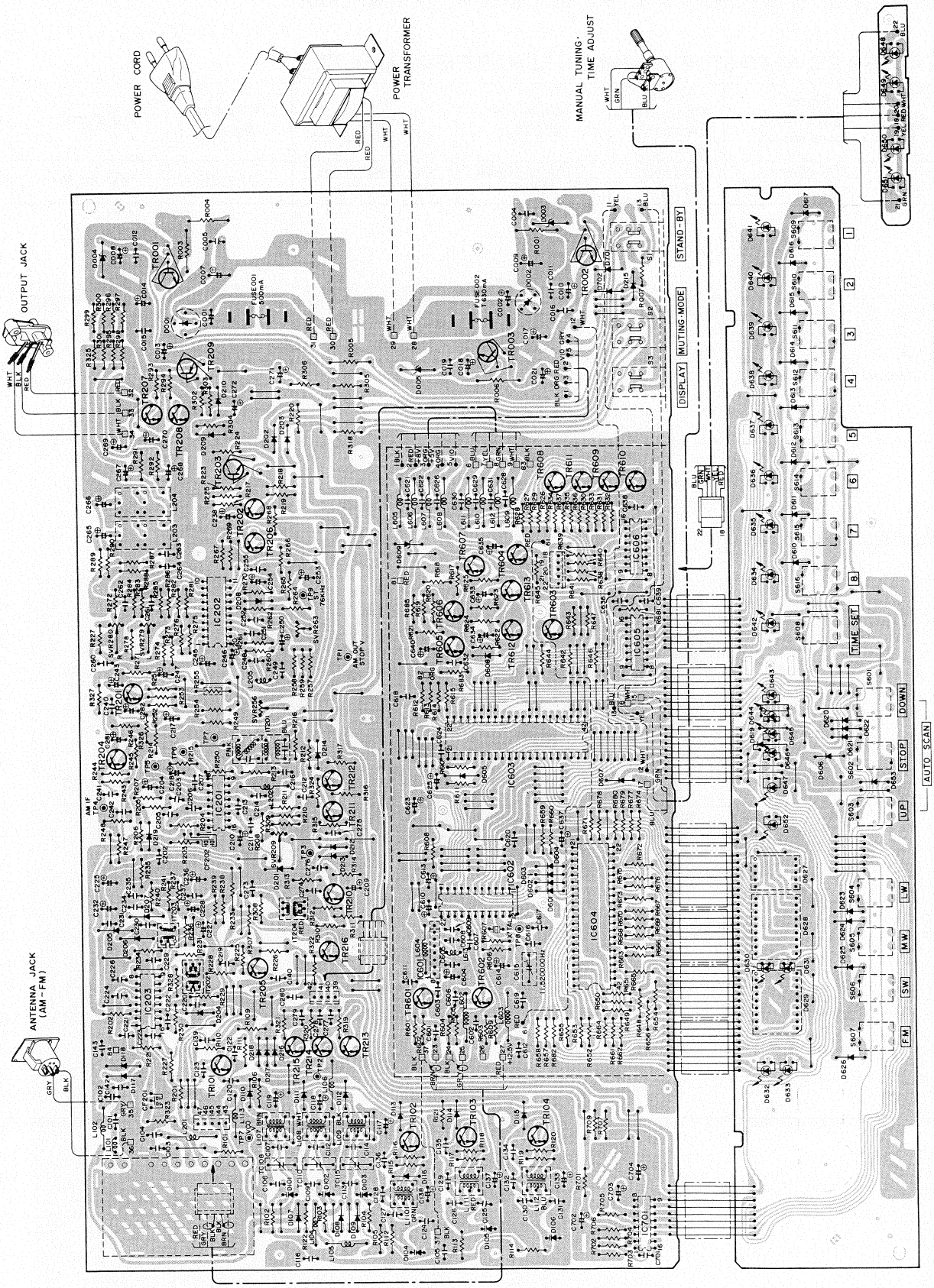


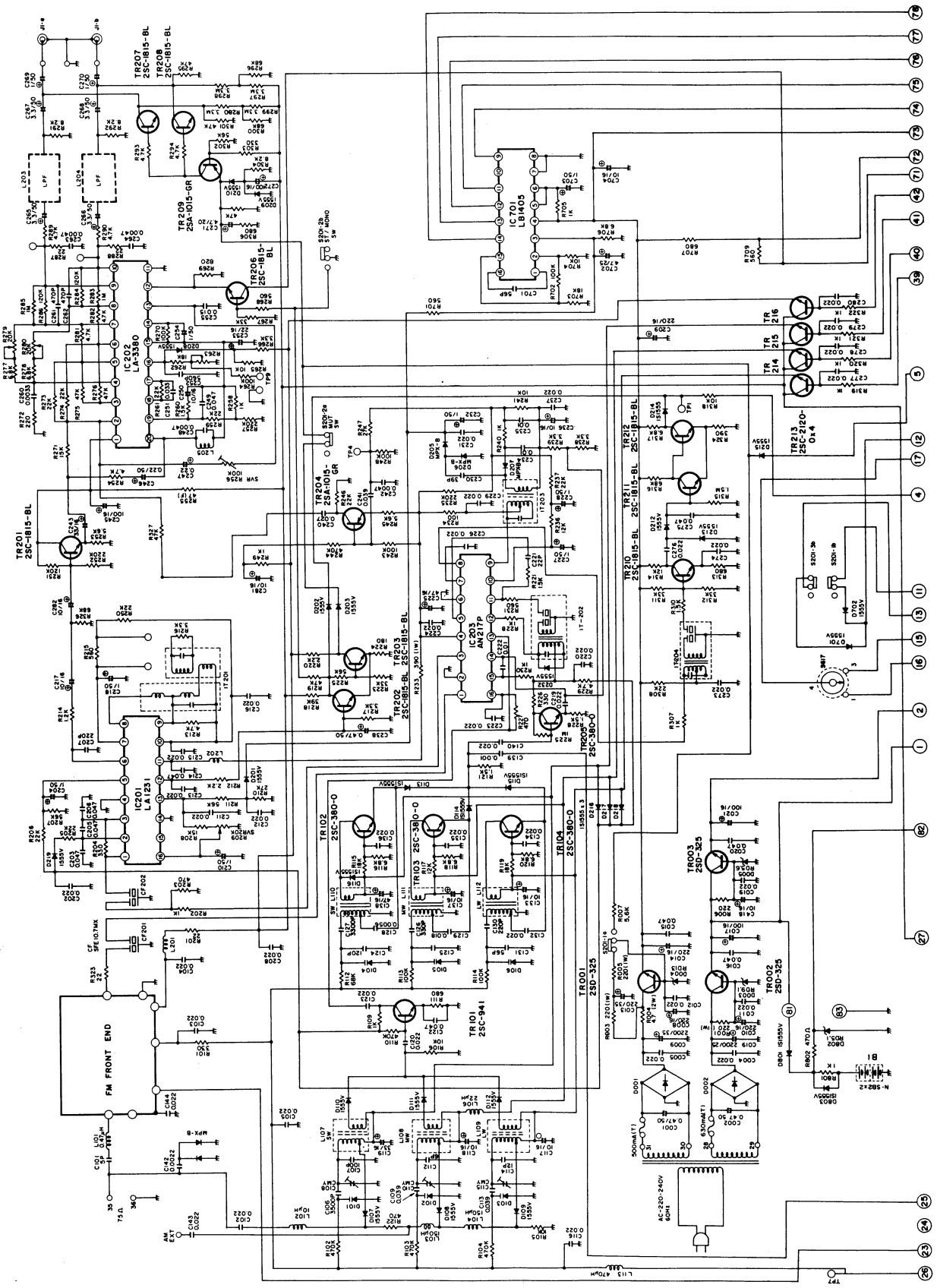
Figure 13

4. PRINTED CIRCUIT BOARD

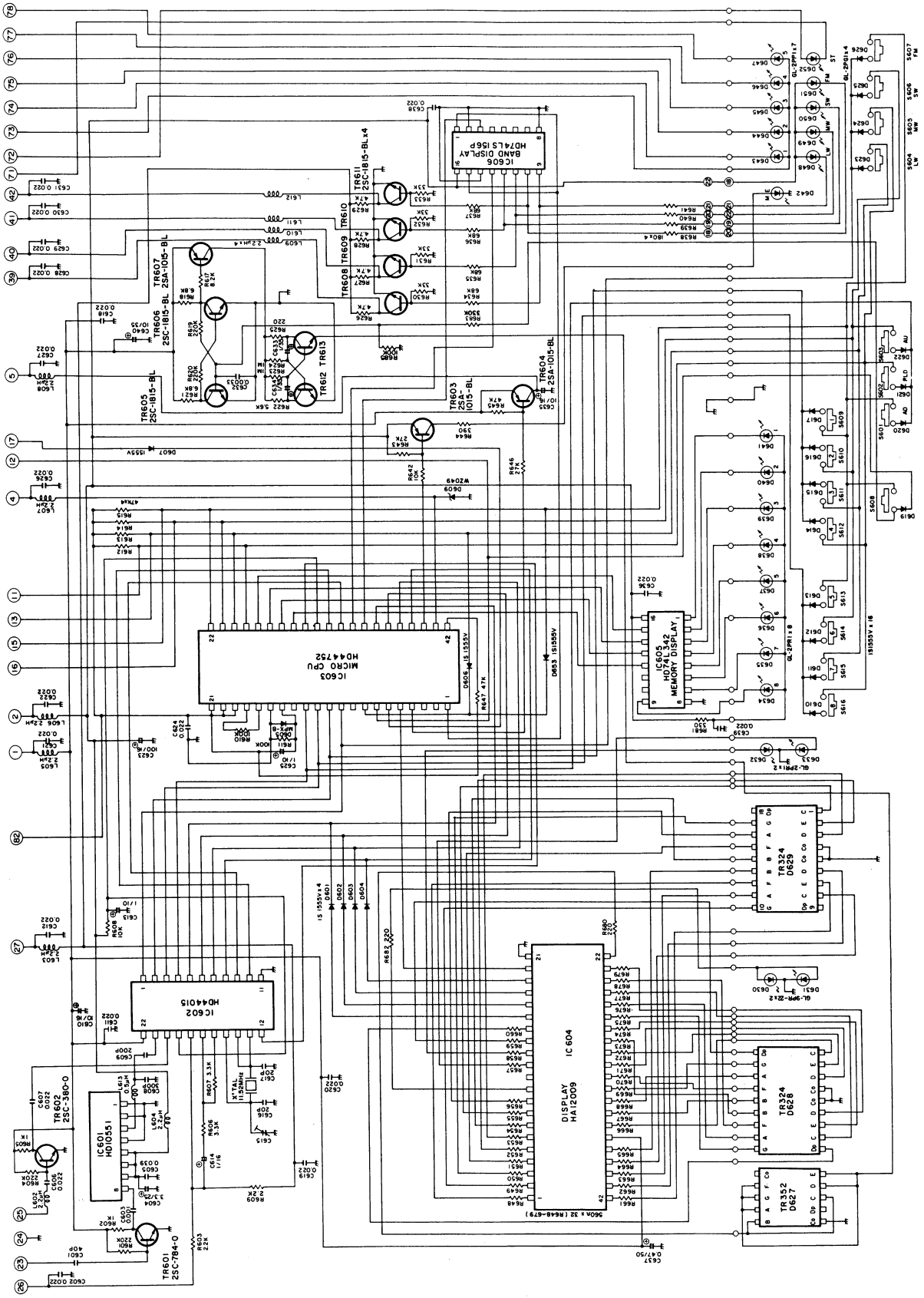
BOTTOM VIEW AND WIRING



5. SCHEMATIC DIAGRAM (1/2)



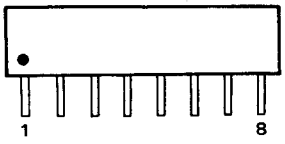
SCHEMATIC DIAGRAM (2/2)



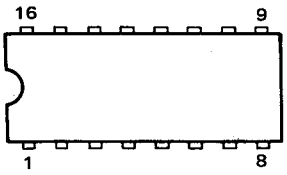
NOTE for SCHEMATIC DIAGRAM

Symbol No.	Part Name	Description
	ICs	
IC201	LA1231	FM IF AMP.
IC202	LB3380	FM MPX AMP.
IC203	AN217	AM-FM IF AMP.
IC601	HD10551	FM PRESCALER
IC602	HD44015	PLL
IC603	HD44752	4 BIT. MICRO COMPUTER
IC604	HA12009	DISPLAY DRIV.
IC605	HD74LS42	MEMORY LED DRIV.
IC606	HD74LS156	BAND LED DRIV.
IC701	LB1405	SIGNAL LED DRIV.
	Transistors	
TR001	2SD325	+ 12V REGULATOR
TR002	2SD325	+ 8V REGULATOR
TR003	2SD325	+ 5V REGULATOR
TR101	2SC941TM	AM RF AMP.
TR102	2SC380TM	SW OSC
TR103	2SC380TM	MW OSC
TR104	2SC380TM	LW OSC
TR201	2SC1815	FM AF AMP.
TR202	2SC1815	FM MUTING SWITCH
TR203	2SC1815	FM MUTING SWITCH
TR204	2SA1015	AM AF AMP.
TR205	2SC380TM	AM OSC AMP.
TR206	2SC1815	FM MODE SWITCH
TR207	2SC1815	FM MUTING SWITCH
TR208	2SC1815	FM MUTING SWITCH
TR209	2SA1015	MUTING SWITCH
TR210	2SC1815	AM IF AMP.
TR211	2SC1815	AM OUT STOP SWITCH
TR212	2SC1815	AM OUT STOP SWITCH
TR213	2SC2120	LW +B SWITCH
TR214	2SC2120	MW +B SWITCH
TR215	2SC2120	SW +B SWITCH
TR216	2SC2120	FM +B SWITCH
TR601	2SC784TM	FM OSC AMP.
TR602	2SC380TM	AM OSC AMP.
TR603	2SA1015	MEMORY STORE LED DRIV.
TR604	2SA1015	MUTING SWITCH
TR605	2SC1815	"E" DISPLAY SWITCHING
TR606	2SA1815	"E" DISPLAY SWITCHING
TR607	2SA1015	"E" DISPLAY SWITCHING
TR608	2SC1815	LW +B SWITCHING
TR609	2SC1815	MW +B SWITCHING
TR610	2SC1815	SW +B SWITCHING
TR611	2SC1815	FM +B SWITCHING
TR612	2SC1815	"E" DISPLAY SWITCHING
TR613	2SC1815	"E" DISPLAY SWITCHING
	Diodes	
D001	W02	RECT.
D002	W02	RECT.
D003	RD9.1E	REGULATOR
D004	RD13E	REGULATOR
D005	RD5.6E	REGULATOR
D101	D-KV-1236	SW ANT. VVCD
D102	D-KV1236	MW ANT. VVCD
D103	D-KV1236	LW ANT. VVCD
D104	D-KV1236	SW OSC VVCD
D105	D-KV1236	MW OSC VVCD
D106	D-KV1236	LW OSC VVCD
D107	1S1555V	SW ANT. SWITCH
D108	1S1555V	MW ANT. SWITCH
D109	1S1555V	LW ANT. SWITCH
D110	1S1555V	SW ANT. SWITCH
D111	1S1555V	MW ANT. SWITCH
D112	1S1555V	LW ANT. SWITCH
D113	1S1555V	SW OSC SWITCH
D114	1S1555V	MW OSC SWITCH
D115	1S1555V	LW OSC SWITCH
D116	1S1555V	SW OSC LIMITTER
D117	MPX-B	ANT. LIMITTER
D118	MPX-B	ANT. LIMITTER

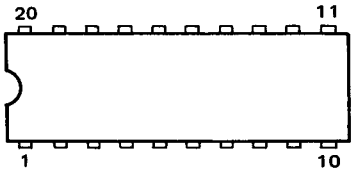
Symbol No.	Part Name	Description
D201	1S1555V	FM IF SWITCH
D202	1S1555V	FM MUTING SWITCH
D203	1S1555V	FM OUT STOP SWITCH
D204	1S1555V	AM IF LIMITTER
D205	MPX-B	AM SIGNAL RECT.
D206	MPX-B	AM SIGNAL RECT
D207	MPX-B	AM DETECT.
D208	1S1555V	FM MPX SWITCH
D209	1S1555V	MUTING SWITCH
D210	1S1555V	MUTING SWITCH
D212	1S1555V	AM OUT STOP RECT.
D213	1S1555V	AM OUT STOP RECT.
D214	1S1555V	AM OUT STOP SWITCH
D215	1S1555V	MUTING SWITCH
D216	1S1555V	SW +B SWITCH
D217	1S1555V	MW +B SWITCH
D218	1S1555V	LW +B SWITCH
D219	1S1555V	FM IF SWITCH
D601	1S1555V	SWITCHING
D602	1S1555V	SWITCHING
D603	1S1555V	SWITCHING
D604	1S1555V	SWITCHING
D605	MPX-B	SWITCHING
D606	1S1555V	SWITCHING
D607	1S1555V	SWITCHING
D608	1S1555V	SWITCHING
D609	WZ049	SWITCHING
D610	1S1555V	SWITCHING
D611	1S1555V	SWITCHING
D612	1S1555V	SWITCHING
D613	1S1555V	SWITCHING
D614	1S1555V	SWITCHING
D615	1S1555V	SWITCHING
D616	1S1555V	SWITCHING
D617	1S1555V	SWITCHING
D618	1S1555V	SWITCHING
D619	1S1555V	SWITCHING
D620	1S1555V	SWITCHING
D621	1S1555V	SWITCHING
D622	1S1555V	SWITCHING
D623	1S1555V	SWITCHING
D624	1S1555V	SWITCHING
D625	1S1555V	SWITCHING
D626	1S1555V	SWITCHING
D627	TR352	7 SEGMENT DISPLAY
D628	TR324	7 SEGMENT DISPLAY
D629	TR324	7 SEGMENT DISPLAY
D630	GL9PR22	TIMER COL. ON
D631	GL9PR22	TIMER COL. ON
D632	GP9PR1	KHz DOT.
D633	GL9PR1	MHz DOT.
D634	GL9PR1	MEMORY 8, DOT.
D635	GL9PR1	MEMORY 7, DOT.
D636	GL9PR1	MEMORY 6, DOT.
D637	GL9PR1	MEMORY 5, DOT.
D638	GL9PR1	MEMORY 4, DOT.
D639	GL9PR1	MEMORY 3, DOT.
D640	GL9PR1	MEMORY 2, DOT.
D641	GL9PR1	MEMORY 1, DOT.
D642	GL9PR1	MEMORY END. INDICATOR
D643	GL9PR1	SIGNAL INDICATOR
D644	GL9PR1	SIGNAL INDICATOR
D645	GL9PR1	SIGNAL INDICATOR
D646	GL9PR1	SIGNAL INDICATOR
D647	GL9PR1	SIGNAL INDICATOR
D648	GL9PG1	LW BAND INDICATOR
D649	GL9PG1	MW BAND INDICATOR
D650	GL9PG1	SW BAND INDICATOR
D651	GL9PG1	FM BAND INDICATOR
D652	GL9PG1	FM BAND INDICATOR
D653	1S1555V	SWITCHING
D701	1S1555V	SWITCHING
D702	1S1555V	SWITCHING
D801	1S1555V	SWITCHING
D802	RD5.1E	REGULATOR
D803	1S1555V	SWITCHING



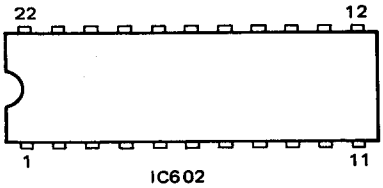
IC601



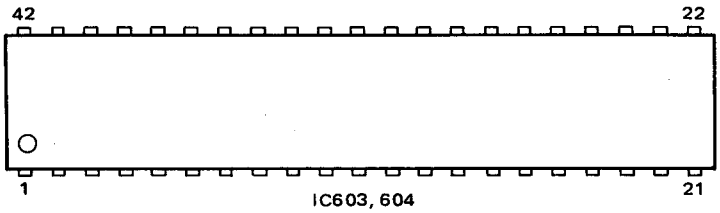
IC201, 203
IC605, 606
IC701



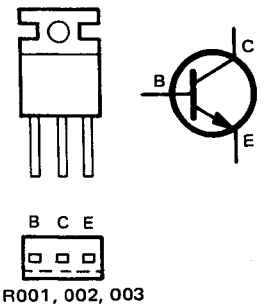
IC202



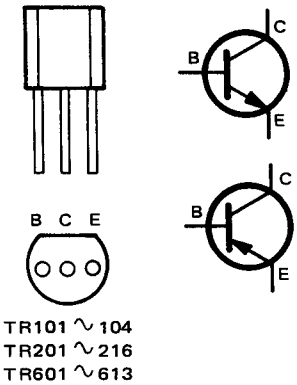
IC602



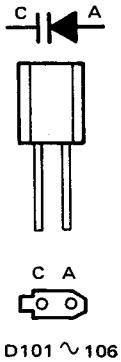
IC603, 604



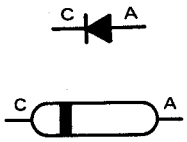
TR001, 002, 003



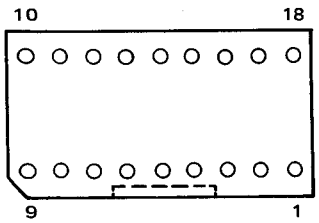
TR101 ∿ 104
TR201 ∿ 216
TR601 ∿ 613



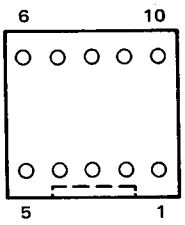
D101 ∿ 106



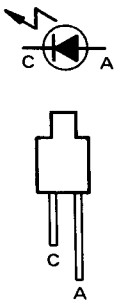
D003 ∿ 005
D107 ∿ 118
D201 ∿ 219
D601 ∿ 626
D653, 701, 702
D801 ∿ 803



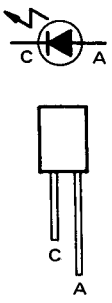
D628, 629



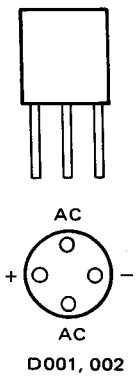
D627



D632 ∿ 652



D630, 631

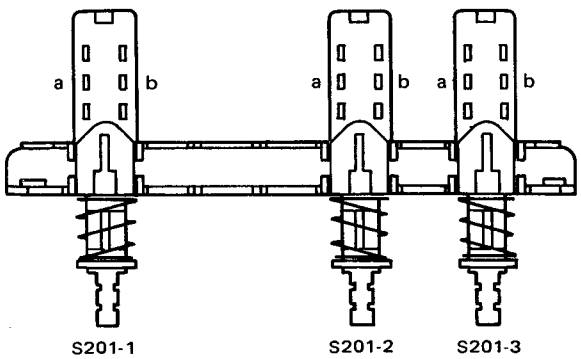


D001, 002

STAND-BY SWITCH

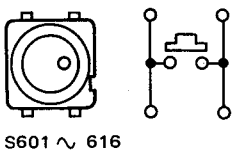
MUTING/MODE SWITCH

DISPLAY SWITCH



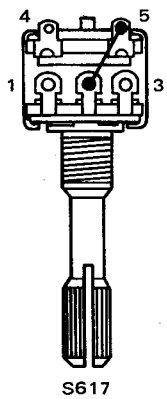
S201-1 S201-2 S201-3

MEMORY SWITCH
MEMORY STORE SWITCH
AUTO SCAN SWITCH
BAND SELECT SWITCH



S601 ∿ 616

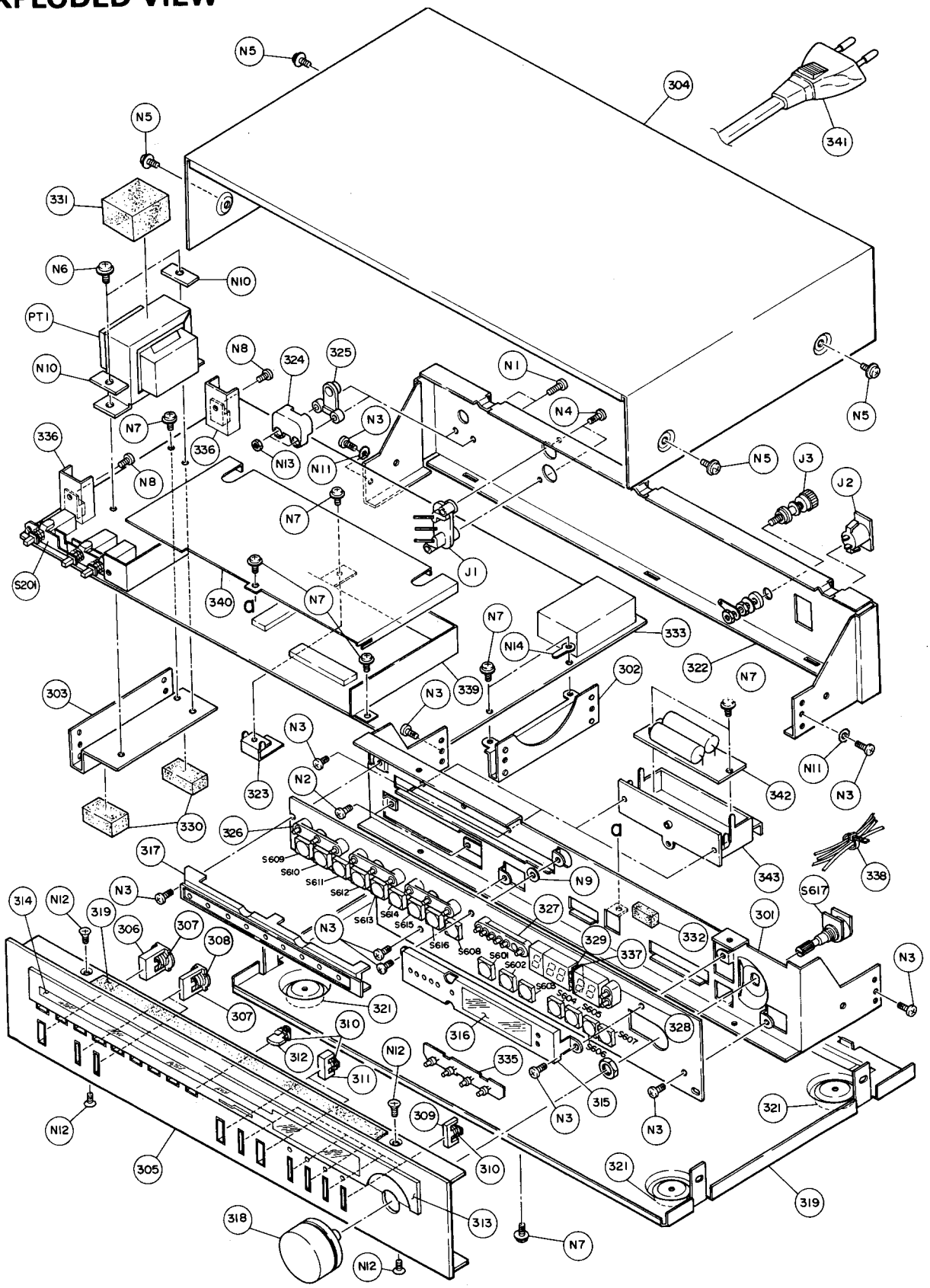
MANUAL UP/DOWN SWITCH



S617

6. EXPLODED VIEW AND PARTS LIST

EXPLODED VIEW



PARTS LIST

ELECTRICAL PARTS LIST

Symbol No.	Part No.	Description
	ICs	
IC201	22114700	IC, LA1231
IC202	22114859	IC, LA3380-B
IC203	22114359	IC, AN217-BB
IC601	22114868	IC, HD10551
IC602	22114869	IC, HD44015
IC603	22114870	IC, HD44752
IC604	22114873	IC, HA12009
IC605	22114871	IC, HD74LS42
IC606	22114872	IC, HD74LS156
IC701	22114769	IC, LB1405
	TRANSISTORS & DIODES Symbol No. with TR: Transistor Symbol No. with D: Diode	
TR001	22114478	2SD325-E
TR002	22114478	2SD325-E
TR003	22114478	2SD325-E
TR101	36752760	2SC941-O
TR102	36707940	2SC380TM-O
TR103	36707940	2SC380TM-O
TR104	36707940	2SC380TM-O
TR201	36317480	2SC1815-BL
TR202	36317480	2SC1815-BL
TR203	36317480	2SC1815-BL
TR204	36534060	2SA1015-GR
TR205	36707940	2SC380TM-O
TR206	36317480	2SC1815-BL
TR207	36317480	2SC1815-BL
TR208	36317480	2SC1815-BL
TR209	36534060	2SA1015-GR
TR210	36317480	2SC1815-BL
TR211	36317480	2SC1815-BL
TR212	36317480	2SC1815-BL
TR213 ∿ 216	36321220	2SC2120-O
TR601	36738120	2SC784TM-O
TR602	36707940	2SC380TM-O
TR603	36534060	2SA1015-GR
TR604	36534060	2SA1015-GR
TR605	36317480	2SC1815-BL
TR606	36317480	2SC1815-BL
TR607	36534060	2SA1015-GR
TR608	36317480	2SC1815-BL
TR609	36317480	2SC1815-BL
TR610	36317480	2SC1815-BL
TR611	36317480	2SC1815-BL
TR612	36317480	2SC1815-BL
TR613	36317480	2SC1815-BL
D001	22115251	W02
D002	22115251	W02
D003	22115643	RD9.1E-B3-M
D004	22115574	RD13E-B3-M
D005	22115672	RD6.2EB-B2
D101/104	22115641	KV1236-X
D102/105	22115641	KV1236-X
D103/106	22115641	KV1236-X
D107	37246745	1S1555V-TP3
D108	37246745	1S1555V-TP3
D109	37246745	1S1555V-TP3
D110	37246745	1S1555V-TP3
D111	37246745	1S1555V-TP3
D112	37246745	1S1555V-TP3
D113	37246745	1S1555V-TP3
D114	37246745	1S1555V-TP3
D115	37246745	1S1555V-TP3
D116	37246745	1S1555V-TP3
D117	22115506	MPX-B-TPS
D118	22115506	MPX-B-TPS
D201	37246745	1S1555V-TP3
D202	37246745	1S1555V-TP3
D203	37246745	1S1555V-TP3
D204	37246745	1S1555V-TP3
D205	22115506	MPX-B-TPS
D206	22115506	MPX-B-TPS
D207	22115506	MPX-B-TPS
D208	37246745	1S1555V-TP3
D209	37246745	1S1555V-TP3
D210	37246745	1S1555V-TP3
D212	37246745	1S1555V-TP3
D213	37246745	1S1555V-TP3
D214	37246745	1S1555V-TP3
D215	37246745	1S1555V-TP3
D216	37246745	1S1555V-TP3
D217	37246745	1S1555V-TP3
D218	37246745	1S1555V-TP3
D219	37246745	1S1555V-TP3

Symbol No.	Part No.	Description
D601	37246745	1S1555V-TP3
D602	37246745	1S1555V-TP3
D603	37246745	1S1555V-TP3
D604	37246745	1S1555V-TP3
D605	22115506	MPX-B-TPS
D606	37246745	1S1555V-TP3
D607	37246745	1S1555V-TP3
D608	37246745	1S1555V-TP3
D609	22115319	WZ050
D610	37246745	1S1555V-TP3
D611	37246745	1S1555V-TP3
D612	37246745	1S1555V-TP3
D613	37246745	1S1555V-TP3
D614	37246745	1S1555V-TP3
D615	37246745	1S1555V-TP3
D616	37246745	1S1555V-TP3
D617	37246745	1S1555V-TP3
D619	37246745	1S1555V-TP3
D620	37246745	1S1555V-TP3
D621	37246745	1S1555V-TP3
D622	37246745	1S1555V-TP3
D623	37246745	1S1555V-TP3
D624	37246745	1S1555V-TP3
D625	37246745	1S1555V-TP3
D626	37246745	1S1555V-TP3
D627	38621520	TLR352
D628	38621540	TLR324
D629	38621540	TLR324
D630	22115642	GL9PRZ2
D631	22115642	GL9PRZ2
D632	22115632	GL2PR1
D633	22115632	GL2PR1
D634	22115632	GL2PR1
D635	22115632	GL2PR1
D636	22115632	GL2PR1
D637	22115632	GL2PR1
D638	22115632	GL2PR1
D639	22115632	GL2PR1
D640	22115632	GL2PR1
D641	22115632	GL2PR1
D642	22115632	GL2PR1
D643	22115632	GL2PR1
D644	22115632	GL2PR1
D645	22115632	GL2PR1
D646	22115632	GL2PR1
D647	22115632	GL2PR1
D648	22115636	GL2PG1
D649	22115636	GL2PG1
D650	22115636	GL2PG1
D651	22115636	GL2PG1
D652	22115632	GL2PR1
D653	37246745	1S1555V-TP3

Symbol No.	Part No.	Description
D701	37246745	1S1555V-TP3
D702	37246745	1S1555V-TP3
D801	37246745	1S1555V-TP3
D802	22115674	RD5.1EB-B3
D803	37246745	1S1555V-TP3
COILS & TRANSFORMERS		
L101	22291009	Choke Coil, FM
L102	22291107	Choke Coil, AF
L103	22291058	Choke Coil, AF
L104	22291058	Choke Coil, AF
L106	22211229	Choke Coil, AF
L107	22282200	Antenna Coil, SW
L108	22242825	Antenna Coil, MW
L109	22202028	Antenna Coil, LW
L110	22285276	OSC Coil, SW
L111	22245332	OSC Coil, MW
L112	22205045	OSC Coil, LW
L113	22291058	Choke Coil, AF
L201	22211229	Choke Coil, AF
L202	22211229	Choke Coil, AF
L203	22232243	MPX Coil
L204	22232243	MPX Coil
L205	22211260	Choke Coil, AF
L602	22211229	Choke Coil, AF
L603	22211229	Choke Coil, AF
L604	22211229	Choke Coil, AF
L605	22211229	Choke Coil, AF
L606	22211229	Choke Coil, AF
L607	22211229	Choke Coil, AF
L608	22211229	Choke Coil, AF
L609	22211229	Choke Coil, AF
L610	22211229	Choke Coil, AF
L611	22211229	Choke Coil, AF
L612	22211229	Choke Coil, AF
L613	22291009	Choke Coil, FM
IT201	22267288	IF Transistor, FM
IT202	22264815	IF Transistor, AM
IT203	22266371	IF Transistor, AM
IT204	22264814	IF Transistor, AM

Symbol No.	Part No.	Description
CAPACITORS Tolerance: D: ±0.5PF, J: ±5%, K: ±10%, M: ±20%, P: +100 to −0%, Z: + 80 to −20%, G: ±2% (N): Non polarity type		
C001	22403085	Electrolytic 0.47 mfd/50WV (N)
C002	22403085	Electrolytic 0.47 mfd/50WV (N)
C004	22342223	Ceramic 0.022 mfd, Z
C006	22342223	Ceramic 0.022 mfd, Z
C007	22447222	Electrolytic 2200 PF/35WV
C008	22445221	Electrolytic 220 PF/16WV
C009	22440385	Electrolytic 2200 PF/25WV
C010	22445221	Electrolytic 220 PF/16WV
C011	22342223	Ceramic 0.022 mfd, Z
C012	22342223	Ceramic 0.022 mfd, Z
C013	22447221	Electrolytic 220 PF/35WV
C014	22445221	Electrolytic 220 PF/16WV
C015	22342473	Ceramic 0.047 mfd, Z
C016	22342473	Ceramic 0.047 mfd, Z
C017	22445101	Electrolytic 100 PF/16WV
C018	22445100	Electrolytic 10 PF/16WV
C019	22342223	Ceramic 0.022 mfd, Z
C021	22445101	Electrolytic 100 PF/16WV
C101	22361509	Ceramic 5 PF, D
C102	22342223	Ceramic 0.022 mfd, Z
C103	22342223	Ceramic 0.022 mfd, Z
C104	22342223	Ceramic 0.022 mfd, Z
C105	22342223	Ceramic 0.022 mfd, Z
C106	22391332	Polypropylene 3300 PF, J
C107	22361101	Ceramic 100 PF, K
C108	22309104	Trimmer Capacitor
C109	22371393	Mylar 0.039 mfd, J
C110	22309104	Trimmer Capacitor
C112	22361609	Ceramic 6 PF, D
C113	22371393	Mylar 0.039 mfd, J
C114	22361100	Ceramic 10 PF, D
C115	22309140	Trimmer Capacitor
C116	22342223	Ceramic 0.022 mfd, Z
C117	22445100	Electrolytic 10 mfd/16WV
C118	22445100	Electrolytic 10 mfd/16WV
C119	22445470	Electrolytic 47 mfd/16WV
C120	22342223	Ceramic 0.022 mfd, Z
C121	22448109	Electrolytic 1 mfd/50WV
C122	22342473	Ceramic 0.047 mfd, Z
C123	22342223	Ceramic 0.022 mfd, Z
C124	22361121	Ceramic 120 PF, K
C125	22361100	Ceramic 10 PF, D
C126	22391331	Polypropylene 330 PF, J
C127	22391332	Polypropylene 3300 PF, J
C128	22371562	Mylar 0.0056 mfd, J

Symbol No.	Part No.	Description
C129	22371183	Mylar 0.018 mfd, J
C130	22391221	Polypropylene 220 PF, J
C131	22361680	Ceramic 68 PF, K
C132	22371223	Mylar 0.022 mfd, J
C133	22445100	Electrolytic 10 mfd/16WV
C134	22342223	Ceramic 0.022 mfd, Z
C135	22342223	Ceramic 0.022 mfd, Z
C136	22342223	Ceramic 0.022 mfd, Z
C137	22445100	Electrolytic 10 mfd/16WV
C138	22445470	Electrolytic 47 mfd/16WV
C139	22343102	Ceramic 0.001 mfd, M
C140	22342223	Ceramic 0.022 mfd, Z
C142	22343222	Ceramic 0.0022 mfd, M
C143	22343223	Ceramic 0.022 mfd, Z
C144	22343223	Ceramic 0.022 mfd, Z
C202	22342223	Ceramic 0.022 mfd, Z
C203	22342473	Ceramic 0.047 mfd, Z
C204	22448109	Electrolytic 1 mfd/50WV
C205	22342473	Ceramic 0.047 mfd, Z
C206	22342473	Ceramic 0.047 mfd, Z
C207	22361221	Ceramic 220 PF, K
C209	22445221	Electrolytic 220 mfd/16WV
C210	22448109	Electrolytic 1 mfd/50WV
C211	22342223	Ceramic 0.022 mfd, Z
C212	22342223	Ceramic 0.022 mfd, Z
C214	22342473	Ceramic 0.047 mfd, Z
C216	22342223	Ceramic 0.022 mfd, Z
C217	22445100	Electrolytic 10 mfd/16WV
C218	22448109	Electrolytic 1 mfd/50WV
C219	22342223	Ceramic 0.022 mfd, Z
C220	22342223	Ceramic 0.022 mfd, Z
C221	22361220	Ceramic 22 PF, J
C222	22342103	Ceramic 0.01 mfd, Z
C223	22342223	Ceramic 0.022 mfd, Z
C224	22342223	Ceramic 0.022 mfd, Z
C225	22445470	Electrolytic 47 mfd/16WV
C226	22342223	Ceramic 0.022 mfd, Z
C227	22448109	Electrolytic 1 mfd/50WV
C228	22448109	Electrolytic 1 mfd/50WV
C229	22342223	Ceramic 0.022 mfd, Z
C230	22361390	Ceramic 39 PF, J
C231	22342223	Ceramic 0.022 mfd, Z
C232	22448109	Electrolytic 1 mfd/50WV
C234	22342103	Ceramic 0.01 mfd, Z
C235	22342103	Ceramic 0.01 mfd, Z
C236	22445100	Electrolytic 10 mfd/16WV
C237	22342223	Ceramic 0.022 mfd, Z
C238	22440305	Electrolytic 0.47 mfd/50WV
C240	22371273	Mylar 0.027 mfd, J

Symbol No.	Part No.	Description
C241	22371393	Mylar 0.039 mfd, J
C242	22343222	Ceramic 0.0022 mfd, M
C243	22440342	Electrolytic 33 mfd/16WV
C245	22445101	Electrolytic 100 mfd/16WV
C246	22440343	Electrolytic 0.22 mfd/50WV
C247	22440343	Electrolytic 0.22 mfd/50WV
C248	22371472	Mylar 0.0047 mfd, J
C249	22342473	Ceramic 0.047 mfd, Z
C250	22445100	Electrolytic 10 mfd/16WV
C251	22371333	Mylar 0.033 mfd, J
C252	22391561	Polypropylene 560 PF, J
C253	22445220	Electrolytic 22 mfd/16WV
C254	22448109	Electrolytic 1 mfd/50WV
C255	22371153	Mylar 0.015 mfd, J
C260	22371332	Mylar 0.0033 mfd, J
C261	22391471	Polypropylene 470 PF, J
C262	22391471	Polypropylene 470 PF, J
C263	22371472	Mylar 0.0047 mfd, J
C264	22371472	Mylar 0.0047 mfd, J
C265	22440388	Electrolytic 3.3 mfd/50WV
C266	22440388	Electrolytic 3.3 mfd/50WV
C267	22440388	Electrolytic 3.3 mfd/50WV
C268	22440388	Electrolytic 3.3 mfd/50WV
C269	22448109	Electrolytic 1 mfd/50WV
C270	22448109	Electrolytic 1 mfd/50WV
C271	22446479	Electrolytic 4.7 mfd/25WV
C272	22445101	Electrolytic 100 mfd/16WV
C273	22342223	Ceramic 0.022 mfd, Z
C274	22342223	Ceramic 0.022 mfd, Z
C275	22342473	Ceramic 0.047 mfd, Z
C276	22342223	Ceramic 0.022 mfd, Z
C277	22342223	Ceramic 0.022 mfd, Z
C278	22342223	Ceramic 0.022 mfd, Z
C279	22342223	Ceramic 0.022 mfd, Z
C280	22342223	Ceramic 0.022 mfd, Z
C281	22445100	Electrolytic 10 mfd/16WV
C282	22445100	Electrolytic 10 mfd/16WV
C601	22361390	Ceramic 39 PF, J
C602	22342223	Ceramic 0.022 mfd, Z
C603	22343102	Ceramic 0.001 mfd, M
C604	22440388	Electrolytic 3.3 mfd/50WV
C605	22371393	Mylar 0.039 mfd, J
C606	22342223	Ceramic 0.022 mfd, Z
C607	22342223	Ceramic 0.022 mfd, Z
C608	22361331	Ceramic 330 PF, K
C609	22361221	Ceramic 220 PF, K
C610	22445100	Electrolytic 10 mfd/16WV
C611	22342223	Ceramic 0.022 mfd, Z
C612	22342223	Ceramic 0.022 mfd, Z
C613	22448109	Electrolytic 1 mfd/50WV

Symbol No.	Part No.	Description
C614	22440314	Electrolytic 1 mfd/50WV
C615	22309104	Trimmer Capacitor
C616	22361200	Ceramic 20 PF, J
C617	22361240	Ceramic 24 PF, J
C619	22342223	Ceramic 0.022 mfd, Z
C620	22342223	Ceramic 0.022 mfd, Z
C621	22342223	Ceramic 0.022 mfd, Z
C622	22342223	Ceramic 0.022 mfd, Z
C623	22445101	Electrolytic 100 mfd/16WV
C624	22342223	Ceramic 0.022 mfd, Z
C625	22448109	Electrolytic 1 mfd/50WV
C626	22342223	Ceramic 0.022 mfd, Z
C628	22342223	Ceramic 0.022 mfd, Z
C629	22342223	Ceramic 0.022 mfd, Z
C630	22342223	Ceramic 0.022 mfd, Z
C631	22342223	Ceramic 0.022 mfd, Z
C632	22371332	Mylar 0.0033 mfd, J
C633	22448109	Electrolytic 1 mfd/50WV
C634	22448109	Electrolytic 1 mfd/50WV
C635	22445100	Electrolytic 10 mfd/16WV
C636	22342223	Ceramic 0.022 mfd, Z
C637	22440305	Electrolytic 0.47 mfd/50WV
C638	22342223	Ceramic 0.022 mfd, Z
C639	22342223	Ceramic 0.022 mfd, Z
C640	22445100	Electrolytic 10 mfd/16WV
C701	22361560	Ceramic 56 PF, K
C702	22446479	Electrolytic 4.7 mfd/25WV
C703	22448109	Electrolytic 1 mfd/50WV
C704	22445100	Electrolytic 10 mfd/16WV

RESISTORS

All fixed resistors are 1/8W, ±5%, carbon resistor unless otherwise noted.
Tolerance: G: ±2%, J: ±5%, K: ±10%

R001	22571221	Metal Oxide	220 ohm, 1W
R003	22571221	Metal Oxide	220 ohm, 1W
R004	22573478	Metal Oxide	4.7 ohm, 2W
R005	22571221	Metal Oxide	220 ohm, 1W
R006	22571221	Metal Oxide	220 ohm, 1W
R007	22543562	5.6K ohm	
R101	22543331	330 ohm	

Symbol No.	Part No.	Description
R102	22543474	470K ohm
R103	22543474	470K ohm
R104	22543474	470K ohm
R105	22543103	10K ohm
R106	22543103	10K ohm
R109	22543102	1K ohm
R110	22543474	470K ohm
R111	22543681	680 ohm
R112	22543563	56K ohm
R113	22543104	100K ohm
R114	22543104	100K ohm
R115	22543183	18K ohm
R116	22543682	6.8K ohm
R117	22543123	12K ohm
R118	22543682	6.8K ohm
R119	22543183	18K ohm
R120	22543682	6.8K ohm
R121	22543152	1.5K ohm
R122	22543471	470 ohm
R123	22543122	1.2K ohm
R201	22543220	22 ohm
R202	22543102	1K ohm
R203	22543471	470 ohm
R204	22543331	330 ohm
R205	22543223	22K ohm
R206	22543223	22K ohm
R207	22543563	56K ohm
R208	22543153	15K ohm
R210	22543273	27K ohm
R211	22543563	56K ohm
R212	22543222	2.2K ohm
R213	22543472	4.7K ohm
R214	22543122	1.2K ohm
R215	22543561	560 ohm
R216	22543332	3.3K ohm
R217	22543332	3.3K ohm
R218	22543393	39K ohm
R219	22543473	47K ohm
R220	22543222	2.2K ohm
R221	22543152	1.5K ohm
R223	22543333	33K ohm
R224	22543181	180 ohm
R225	22543105	1M ohm
R226	22543331	330 ohm
R227	22543471	470 ohm
R228	22543152	1.5K ohm
R229	22543472	4.7K ohm
R230	22543102	1K ohm
R231	22543561	560 ohm

Symbol No.	Part No.	Description
R233	22571391	Metal Oxide 390 ohm
R234	22543101	100 ohm
R235	22543224	220K ohm
R236	22543123	12K ohm
R237	22543223	22K ohm
R238	22543332	3.3K ohm
R239	22543332	3.3K ohm
R240	22543102	1K ohm
R241	22543103	10K ohm
R243	22543104	100K ohm
R244	22543474	470K ohm
R245	22543562	5.6K ohm
R246	22543223	22K ohm
R247	22543273	27K ohm
R248	22543104	100K ohm
R249	22543102	1K ohm
R250	22543223	22K ohm
R251	22543124	120K ohm
R252	22543224	220K ohm
R253	22543562	5.6K ohm
R254	22543472	4.7K ohm
R255	22500246	Fusible 47 ohm, J
R257	22543224	220K ohm
R258	22543102	1K ohm
R259	22543223	22K ohm
R260	22543152	1.5K ohm
R261	22543223	22K ohm
R262	22543183	18K ohm
R264	22543104	100K ohm
R265	22543103	10K ohm
R266	22543332	3.3K ohm
R267	22543333	33K ohm
R268	22543561	560 ohm
R269	22543102	1K ohm
R270	22543104	100K ohm
R271	22543153	15K ohm
R272	22543221	220 ohm
R273	22543223	22K ohm
R274	22543223	22K ohm
R275	22543472	4.7K ohm
R276	22543472	4.7K ohm
R277	22543682	6.8K ohm
R278	22543682	6.8K ohm
R280	22543335	3.3M ohm
R281	22543472	4.7K ohm
R282	22543472	4.7K ohm
R283	22543105	1M ohm
R284	22543124	120K ohm
R285	22543105	1M ohm
R286	22543124	120K ohm
R287	22543220	22 ohm

Symbol No.	Part No.	Description
R288	22543220	22 ohm
R289	22543472	4.7K ohm
R290	22543472	4.7K ohm
R291	22543822	8.2K ohm
R292	22543822	8.2K ohm
R293	22543472	4.7K ohm
R294	22543472	4.7K ohm
R295	22543473	47K ohm
R296	22543683	68K ohm
R297	22543335	3.3M ohm
R298	22543335	3.3M ohm
R299	22543335	3.3M ohm
R300	22543683	68K ohm
R301	22543473	47K ohm
R302	22543563	56K ohm
R303	22543334	330K ohm
R304	22543822	8.2K ohm
R305	22543473	47K ohm
R306	22543681	680 ohm
R307	22543102	1K ohm
R308	22543222	2.2K ohm
R309	22543333	33K ohm
R310	22543152	1.5K ohm
R311	22543333	33K ohm
R312	22543332	3.3K ohm
R313	22543681	680 ohm
R314	22543123	12K ohm
R315	22543155	1.5M ohm
R316	22543683	68K ohm
R317	22543682	6.8K ohm
R318	22543103	10K ohm
R319	22543102	1K ohm
R320	22543102	1K ohm
R321	22543102	1K ohm
R322	22543102	1K ohm
R323	22543220	22 ohm
R324	22543391	390 ohm
R325	22543563	56K ohm
R326	22543683	68K ohm
R327	22543473	47K ohm
R328	22543102	1K ohm
R601	22543224	220K ohm
R602	22543102	1K ohm
R603	22543222	2.2K ohm
R604	22543224	220K ohm
R605	22543102	1K ohm
R606	22543332	3.3K ohm
R607	22543332	3.3K ohm
R608	22543103	10K ohm
R609	22543222	2.2K ohm
R610	22543104	100K ohm
R611	22543104	100K ohm
R612	22543473	47K ohm
R613	22543473	47K ohm

Symbol No.	Part No.	Description
R614	22543473	47K ohm
R615	22543473	47K ohm
R617	22543822	8.2K ohm
R618	22543682	6.8K ohm
R619	22543224	220K ohm
R620	22543224	220K ohm
R621	22543682	6.8K ohm
R622	22543562	5.6K ohm
R623	22543105	1M ohm
R624	22543105	1M ohm
R625	22543221	220 ohm
R626	22543472	4.7K ohm
R627	22543472	4.7K ohm
R628	22543472	4.7K ohm
R629	22543472	4.7K ohm
R630	22543333	33K ohm
R631	22543333	33K ohm
R632	22543333	33K ohm
R633	22543333	33K ohm
R634	22543683	68K ohm
R635	22543683	68K ohm
R636	22543683	68K ohm
R637	22543683	68K ohm
R638	22543181	180 ohm
R639	22543181	180 ohm
R640	22543181	180 ohm
R641	22543181	180 ohm
R642	22543103	10K ohm
R643	22543273	27K ohm
R644	22543391	390 ohm
R645	22543473	47K ohm
R646	22543273	27K ohm
R647	22543473	47K ohm
R648	22543561	560 ohm
R649	22543561	560 ohm
R650	22543561	560 ohm
R651	22543561	560 ohm
R652	22543561	560 ohm
R653	22543561	560 ohm
R654	22543561	560 ohm
R655	22543561	560 ohm
R656	22543561	560 ohm
R657	22543561	560 ohm
R658	22543561	560 ohm
R659	22543561	560 ohm
R660	22543561	560 ohm
R661	22543561	560 ohm
R662	22543561	560 ohm
R663	22543561	560 ohm
R664	22543561	560 ohm
R665	22543561	560 ohm
R666	22543561	560 ohm
R667	22543561	560 ohm

Symbol No.	Part No.	Description
R668	22543561	560 ohm
R669	22543561	560 ohm
R670	22543561	560 ohm
R671	22543561	560 ohm
R672	22543561	560 ohm
R673	22543561	560 ohm
R674	22543561	560 ohm
R675	22543561	560 ohm
R676	22543561	560 ohm
R677	22543561	560 ohm
R678	22543561	560 ohm
R679	22543561	560 ohm
R680	22543221	220 ohm
R681	22543331	330 ohm
R682	22543221	220 ohm
R683	22543334	330K ohm
R685	22543104	100K ohm
R701	22543561	560 ohm
R702	22543104	100K ohm
R703	22543183	18K ohm
R704	22543103	10K ohm
R705	22543102	1K ohm
R706	22543682	6.8K ohm
R707	22543681	680 ohm
R709	22543561	560 ohm
R801	22543102	1K ohm
R802	22543471	470 ohm
SVR209	22658455	Semi-Fixed 20K ohm
SVR256	22658456	Semi-Fixed 100K ohm
SVR263	22658514	Semi-Fixed 10K ohm
SVR279	22658455	Semi-Fixed 20K ohm
SVR280	22658455	Semi-Fixed 20K ohm

Symbol No.	Part No.	Description
MISCELLANEOUS		
CF201	22153146	Ceramic Filter
CF202	22153146	Ceramic Filter
S1	22140655	Push Switch
S601	22140510	Switch Key (DOWN)
S602	22140510	Switch Key (STOP)
S603	22140510	Switch Key (UP)
S604	22140510	Switch Key (LW)
S605	22140510	Switch Key (MW)
S606	22140510	Switch Key (SW)
S607	22140510	Switch Key (FM)
S608	22140510	Switch Key (MEMORY STORE/ TIME SET)
S609 ∿ 616	22140510	Switch Key (MEMORY)
S617	22140656	Tuning Switch
J1-a	22163765	US2P Jack
J1-b	22163765	US2P Jack
J2	22164880	DIN Plug Antenna
J3	22162388	S1P Terminal
PT1	22223546	Power Transformer
F001	22144192	Fuse, T 0.5
F002	22144212	Fuse, T 0.63
X1	22153147	X-Tal
B1	22101302	Rechargeable battery N-S02

EXPLODED VIEW PARTS

Symbol No.	Part No.	Description
301	20015833	Chassis
302	20735706	Bracket
303	20735709	Power Transformer Bracket
304	20848607	Top Cabinet
305	20836701	Panel
306	20874675	Push Button
307	22776666	Spring
308	20874676	Push Button
309	20874677	Push Button
310	22776667	Spring
311	20874678	Push Button
312	20874679	Push Button
313	20836702	Decoration Panel
314	20848633	Dial Cover
315	20019691	Dial Plate
316	20848631	LED Cover A
317	20848632	LED Cover B
318	20872637	Tuning Knob
319	22756528	Cushion
320	22832822	Bottom Cabinet
321	20842649	Foot
322	20015830	Back Chassis
323	20747601	P.C. Board Support
324	22754791	Cord Clamper
325	22184183	Cord Clamper
326	20747615	LED Support A
327	20747617	LED Support B
328	20747618	LED Support C
329	20747619	LED Support D
330	22756979	Cushion
331	22756991	Cushion
332	22756569	Cushion
333	22193234	Radio P.C. Board
334	22193235	Control P.C. Board
335	22193236	LED P.C. Board
336	22748794	Radiator
337	22753697	Spacer
338	20975612	Band
339	22748868	Case Shielder
340	22648869	Cover Shielder
341	22176529	Power Cord
342	22193297	Battery P.C. Board
343	20735696	Fuse Bracket

Symbol No.	Part No.	Description
SCREWS & RINGS		
N1	22701716	Bind Head 3.0 x 14mm
N2	20795955	Bind Head 3.0 x 6mm with SW
N3	72633008	Bind Head Tapping 3.0 x 8mm
N4	22701724	Bind Head Tapping 3.0 x 10mm
N5	20795992	Pan Head 3.0 x 8mm with W
N6	22701586	Pan Head 3.0 x 8mm with WW
N7	20975908	Pan Head Tapping 3.0 x 8mm with W
N8	20795924	Tap Tight 3.0 x 5mm
N9	22753652	Washer 4.3ϕ
N10	20791809	Special Washer
N11	74022030	Lock Washer 3.0ϕ
N12	70443006	Flat Head Screw 3.0 x 6mm
N13	73653000	Nut 3.0ϕ
N14	22161061	Terminal Lug 3.0ϕ
ACCESSORIES		
	22124277	AM Antenna
	22124971	FM Antenna
	22164836	US1P Plug Cord
	22951862	Warranty Card
	22953945	Owner's Manual